

(GOSS NET 1)

Tape 57

Page 5

terrain at the terminator, which should come in quite well in the TV.

03 13 44 26

CC

Roger.

03 13 44 28

CMP

We don't know whether you can see it from the TV screen, but the moon is nothing but a milky white - completely void. We're changing the cameras to the other window now.

03 13 44 58

CDR

This is Apollo 8, coming to you live from the moon. We've had to switch the TV cameras now. We showed you first a view of earth as we've been watching it for the past 16 hours. Now we're switching so that we can show you the moon that we've been flying over at 60 miles altitude for the last 16 hours. Bill Anders, Jim Lovell, and myself have spent the day before Christmas up here doing experiments, taking pictures, and firing our spacecraft engines to maneuver around. What we will do now is follow the trail that we've been following all day and take you on through to a lunar sunset. The moon is a different thing to each one of us. I think that each one of us - each one carries his own impression of what he's seen today. I know my own impression is that it's a vast, lonely, forbidding-type existence, or expanse of nothing, that looks rather like clouds and clouds of purice stone, and it certainly would not appear to be a very inviting

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place to live or work. Jim, what have you thought most about?

03 13 46 23

CMP

Well, Frank, my thoughts are very similar. The vast loneliness up here of the moon is awe inspiring, and it makes you realize just what you have back there on earth. The earth from here is a grand oasis in the big vastness of space.

03 13 46 41

CDR

Bill, what do you think?

03 13 46 44

LMP

I think the thing that impressed me the most was the lunar sunrises and sunsets. These in particular bring out the stark nature of the terrain, and the long shadows really bring out the relief that is here and hard to see at this very bright surface that we're going over right now.

O

03 13 47 05

CDR

You're describe - that's not color, Bill. Describe some of the physical features of what you're showing the people.

03 13 47 17

CC

Apollo 8, Houston. We're not receiving a picture now. Over.

03 13 47 24

LMP

We're now coming on to Smyth's Sea, a small mare region covered with a dark, level material. There is a fresh, bright, impact crater on the edge towards us and a mountain range on the other side. These mountains are the Pyrenees.

O

03 13 47 48

CC

Apollo 8, we're not receiving modulation on the signal; we do have SYNC.

03 13 47 58

CDR

Are you reading us? Apollo, Houston.

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03 13 48 02 CC Apollo 8, we're reading you loud and clear, but no picture. We have no modulation.

03 13 48 07 CMP Roger. We understand. Take a look now.

03 13 48 09 CMP How about now? Apollo.

03 13 48 12 CC Loud and clear. Good picture.

03 13 48 28 CMP What you're seeing has been cross - Smyth's Sea are the craters Castner and Gilbert, and what we've noticed especially, that you cannot see from the earth, are the small bright impact craters that dominate the lunar surface.

03 13 49 03 LMP The horizon here is very, very stark. The sky is pitch black, and the earth - or the moon, rather, excuse me - is quite light; and the contrast between the sky and the moon is a vivid, dark line. Coming into the view of the camera now are some interesting old double ring craters, some interesting features that are quite common in the mare region and have been filled by some material the same consistency of the maria and the same color. Here are three or four of these interesting features. Further on the horizon you see the ... The mountains coming up now are heavily impacted with numerous craters whose central peaks you can see in many of the larger ones.

03 13 50 08 CMP Actually, I think the best way to describe this area is a vastness of black and white, absolutely no color.

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03 13 50 22 LMP The sky up here is also rather forbidding, fore-
boding expanse of blackness, with no stars visible
when we're flying over the moon in daylight.

03 13 50 52 LMP You can see by the numerous craters that this
planet has been bombarded through the eons with
numerous small asteroids and meteoroids pock-
marking the surface every square inch.

03 13 51 11 CMP And one of the amazing features of the surface
is the roundness that most of the craters - seems
that most of them have a round mound type of ap-
pearance instead of sharp, jagged rocks.

0

03 13 51 23 LMP Only the newest feature is of any sharp definition
to them, and eventually they get eroded down by
the constant bombardment of small meteorites.

03 13 51 45 LMP How is the picture now, Houston? Houston, are
you reading us?

03 13 51 54 CC Loud and clear, and the picture looks real fine.

03 13 52 00 LMP Thank you.

03 13 52 04 LMP Can you see the two large craters just to the
right of our track, Houston?

03 13 52 15 CC That's affirmative.

03 13 52 51 LMP The very bright features you see are the new im-
pact craters, and the longer a crater has been
on the surface of the moon, why, the more mottled
and subdued it becomes. Some of the - -

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03 13 53 25 CC Apollo 8, we've apparently lost your voice; the
picture is still good.

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03 13 53 32 LMP Roger.

03 13 53 37 CMP Houston, we're passing over an area that's just east of the Smyth's Sea now, in checking our charts. Smyth's Sea is coming up in a few minutes.

03 13 53 51 CC Roger.

03 13 54 12 CC Apollo 8, if you go to P00 and ACCEPT, we'll up-link some information.

03 13 54 43 LMP We are now coming up towards the terminator, and I hope soon that we'll be able to show you the varying contrast of white as we go into the darkness. Houston, we're in P00, and you have the computer.

03 13 54 58 CC Thank you.

03 13 55 16 LMP We're now approaching a series of small impact craters. There is a dark area between us and them which could possibly be an old lava flow.

03 13 55 58 LMP You can see the large mountains on the horizon now ahead of the spacecraft to the north of our track.

03 13 56 25 LMP The intensity of the sun's reflection in this area makes it difficult for us to distinguish the features we see on the surface, and I suppose it's even harder on the television, but as we approach the terminator and the shadows become longer, you'll see a marked change.

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03 13 57 00

LMP

There is a very dark crater in the filling material in this valley in front of us now. It is rather unusual in that it is sharply defined, yet it's dark all over its interior walls, whereas most new-looking craters are of very bright interior.

03 13 57 38

LMP

Small impact crater in front of us now in the little mare well defined, quite new, and another one approaching. The spacecraft is facing North. From our track, we are going sideways to our left.

03 13 58 11

LMP

You are now seeing the Sea of Crises coming over the horizon.

END OF TAPE

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03 13 58 37 LMP We believe the crater, the large dark crater between the spacecraft and the Sea of Crises is Condorcet Crater. The Sea of Crises is amazingly smooth as far as the horizon and past this rather rough mountainous region in front of the spacecraft.

03 13 59 10 CC Apollo 8, we are through with the computer. You can go back to BLOCK, and it looks like we are getting a lot of reflection off your window now.

03 13 59 25 LMP Roger. We'll switch windows. How does that look now, Ken? *meetingly*

03 13 59 41 CC That's real fine.

03 14 00 26 CC Apollo 8, can you tell us which window you are looking out? And there is a large crater, looks like it is sticking up in the upper right hand corner of our picture. Can you identify that one?

03 14 00 43 LMP Roger. We are just about to lose our lock; that is why we are slowing up a little bit. We see the Sea of Crises in front of us now. We are looking out the left hand rendezvous window.

03 14 01 28 LMP Houston, how are you reading us now?

03 14 01 30 CC Loud and clear.

03 14 01 34 LMP The crater you see on the horizon is the Sea of Crises. How are you reading us, Houston?

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03 14 01 47 CC Loud and clear, Apollo 8, and we have a picture that is good.

03 14 01 51 LMP Right.

03 14 01 53 IMP Roger. We are getting a lot of static. The Sea of Crises is in front of us on the horizon, and the dark crater Picard can be seen in the middle. We are now breaking the moon's sunrise or the spacecraft's sunset. This is an area that the sun has just recently come up on the moon. The mare we are over now has a mottled look about it, but not very heavily cratered, so it must be relatively new. This is the Sea of Fertility, and we're coming upon a large crater, the delta rim variety; has a strange circular cracked pattern around the middle of it. The crater that you see now is about 30 or 40 miles across.

03 14 03 51 LMP How is your picture quality, Houston?

03 14 03 55 CC This is phenomenal.

03 14 04 00 IMP There is an interesting rill directly in front of the spacecraft now, running along the edge of a small mountain; rather sinuous shape with right-angle turns.

03 14 04 30 CMP This area just to the west of the Sea of Crises is called the Marsh of Sleep and to the west of that the Sea of Tranquility.

03 14 04 40 LMP Can you see the fracture patterns going across the mare in front of us now, Houston?

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03 14 04 47

CC

That doesn't quite stand out.

03 14 04 53

LMP

Roger. The series of cracks or faults across the middle of the mare: they drop down in about three steps to the south. The parallel fault pattern to the north has a drop down in the center. I hope all of you back down on earth can see what we mean when we say that it is a rather foreboding horizon, a very rather dark and unappetizing looking place. We are now going over - approaching one of our future landing sites selected in this smooth region to - called the Sea of Tranquility - smooth in order to make it easy for the initial landing attempts in order to preclude the having to dodge mountains. Now you can see the long shadows of the lunar sunrise. We are now approaching the lunar sunrise, and for all the people back on earth, the crew of Apollo 8 has a message that we would like to send to you.

03 14 06 56

LMP

In the beginning, God created the Heaven and the Earth. And the Earth was without form and void, and darkness was upon the face of the deep. And the spirit of God moved upon the face of the waters. and God said, "let there be light." And there was light. And God saw the light and that it was good, and God divided the light from the darkness. And God called the light Day, and the darkness he called Night. And the evening and the morning

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So CC did make a comment on how good the show was

6
were the first day. And God said, "let there be a firmament in the midst of the waters. And let it divide the waters from the waters." And God made the firmament and divided the waters which were under the firmament from the waters which were above the firmament. And it was so. And God called the firmament Heaven. And the evening and the morning were the second day.

03 14 08 07

CDR

Bonny 9
And God said, "let the waters under the Heavens be gathered together into one place. And let the dry land appear." And it was so. And God called the dry land Earth. And the gathering together of the waters called the seas. And God saw that it was good. And from the crew of Apollo 8, we close with good night, good luck, a Merry Christmas and God bless all of you - all of you on the good Earth.

03 14 09 46

CDR

Houston, how do you read? Apollo 8.

03 14 09 48

CC

Loud and clear, Apollo 8. And thank you for a very good show. We have a maneuver PAD for you when you are ready to copy.

03 14 10 00

CDR

Houston, Apollo 8.

03 14 10 02

CC

Apollo 8, read you loud and clear.

03 14 10 07

CDR

Roger. Are we off the air now?

03 14 10 21

CC

That's affirmative, Apollo 8. You are.

03 14 10 26

CDR

Did you read everything that we had to say there?

10/11/78
in JAC Commentary 228/1

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03 14 10 29 CC Loud and clear. Thank you for a real good show.

03 14 10 34 CDR Okay. Now, Ken, we'd like to get all squared away for TEI here. Can you give us some good words like you promised?

03 14 10 41 CC Yes, sir. I have a maneuver PAD. I think we would like to start by dumping the tape. If we can have that, I have your TEI 10 maneuver PAD, and then we will run through a systems brief.

03 14 10 59 CDR I understand this is a maneuver PAD that we will use for TEI. Is that correct?

03 14 11 11 IMP And you got the tape, Houston.

03 14 11 13 CC Thank you.

03 14 11 18 CMP Ready to copy, Ken.

03 14 11 20 CC Roger. TEI 10, SPS/G&N: 45597, minus 040, plus 157 08919 1564, plus 35189, minus 01513, minus 00346 180 007 000, November Alfa plus 00186 35223 318 35019 42 0928 253, boresight star Scorpii Delta (another name for it is Dzubá) down 071, left 45, plus 0748 minus 16500 12995 363 00146 5005; primary star Sirius, secondary, Rigel, 129 155 010; four quads, 15 second, ullage; horizon on the 2.9 window line at T minus 3; use high-speed procedure with minus Mike Alfa. Over.

was edited
- or off the
- air.

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03 14 14 40 CMP Okay. TEI PAD as follows: SPS/G&N: 45597,
minus 040, plus 157 08919 1564, plus 35189,
minus 01513, minus 00346 180 007 000, not
applicable, plus 00186 35223 318 35019 42 0928
253, Scorpii Delta (Dzuba), down 071, left 45,
plus 0748 minus 16500 12995 36300 146 5005;
Sirius, Rigel, 129 155 010; four quads, 15 sec-
onds, 2.9-degree window line at TIG minus 3,
high-speed procedure minus MA.

03 14 16 09 CC That's correct, Apollo 8.

03 14 16 17 CDR Ken, this is Frank. I want to -- I want to
make one thing certain. This the load that
we are to use to burn with, right? This is
not just a PAD data for 10 abort?

03 14 16 32 CC Okay, Apollo 8. We will update this PAD prior
to the burn.

03 14 16 40 CDR Oh, you will? Okay.

03 14 16 42 CC Yes, sir.

03 14 16 46 CDR Say again.

03 14 19 39 CC Apollo 8, Houston.

03 14 19 44 CDR Go ahead, Houston. Apollo 8.

03 14 19 46 CC Roger. I am reading you with a lot of background
noise. Can you read me clearly?

03 14 19 54 CDR Roger.

03 14 19 55 CC Okay. I am going to give you a quick summary
of systems. Basically, all systems are good. In

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respect to your return trajectory, we can still get to the mid-Pacific line at 146 hours by waiting as late as the thirteenth REV. After 138 seconds of the burn, you are on your way home. The weather in the recovery area looks good. Apollo 8, did you call?

03 14 20 43	CDR	Continue, Houston.
03 14 21 05	CC	Apollo 8, Houston. Could we have the high gain for a little bit longer?
03 14 21 12	CDR	We broke scan on it, (Ken.)
03 14 21 15	CC	Okay. You are coming in loud and clear now. Did you copy my trajectory information?
03 14 21 20	CDR	We are on OMNI B now.
03 14 21 23	CC	Roger. That is fine.
03 14 21 24	CDR	Say again, please. Go ahead. We are 130 - Will you say again, please?
03 14 21 29	CC	Wilco, Apollo 8. First, if you can spare, we would like to have the high gain to complete the dump.
03 14 21 54	CDR	Stand by. We will try to get it for you.
03 14 21 56	CC	Roger.
03 14 22 17	CDR	In a couple of minutes there, Houston.
03 14 22 19	CC	Roger. Thank you.
03 14 22 47	CC	Okay, Apollo 8. While we are - -
03 14 22 57	CC	Apollo 8, while we are waiting for the high gain, I will continue the trajectory summary. We can

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still get back to the mid-Pacific line in 146 hours from the thirteenth REV, and you are on your way after 138 seconds of the burn. That's 138 seconds, gets you clear of the butterfly region. We recommend not trying preignitions or restarts after 20 seconds. If you go beyond 20 seconds, this may get the trajectory beyond the correction - RCS correction capability to a free return. The weather in recovery area is good. We have an AOS following TEI of 89 plus 28 plus 39 and an AOS without TEI of 89 plus 37 plus 24. During the burn, you may notice a slight change in chamber pressure and tank pressures due to the fuel exhaustion in the storage tank and going to the sump tank. This may occur somewhere around 2 to 5 seconds into the burn. It'll be a small change in pressures in both systems. Going down the systems, all systems are GO. In ECS, we want to stop water boiling after TEI for trajectory purposes. Your water dump situation looks good; you should be good to greater than 105 hours. We'll try to hold off the water dump until after MCC 5. In the EPS, we'd like to stir the cryos prior to TLI - correction TEI. The next purge on the fuel cells will occur at approximately 92 hours, and that will be both hydrogen and oxygen. Your battery status: battery A 34.9, battery B 39.1, and Charlie 38.5. We have the

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single tank cryo capability. SPS: looking at the performance on the previous burns, you can anticipate a normal burn taking approximately 3.7 seconds in excess of the computed values. Engine performance looks nominal, and all parameters have been steady. RCS looks good; all four quads according to the computer programs have approximately the same capacity. You have a good REFSMMAT to take you through TEI. We'll have a post TEI PTC attitude for you in a few minutes, and that just about wraps up what we have on systems. Over.

03 14 26 43

CDR

Roger. Thank you, Houston. We appreciate the summary. We're trying to get high gain.

03 14 26 49

CC

Roger.

03 14 26 53

OMP

I think we have it.

03 14 26 54

CDR

You do have the high gain. Now, Ken, as I understand it, if it shuts down after 20 seconds of burn, you don't want us to try to re-light it. Is that what you said?

03 14 27 04

CC

Stand by.

03 14 27 12

CC

Apollo 8, the intent was do not delay ignitions beyond 20 seconds. Over.

03 14 27 21

CDR

Oh, do not delay ignition beyond 20 seconds.

Roger.

03 14 27 24

CC

That's affirm.

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03 14 27 27 CDR Okay. You want me to start it on tank A and
then switch to B again like we did on our LOI,
right?

03 14 27 39 CC That's affirmative.

03 14 27 43 CDR Okay.

03 14 27 47 CDR Did you put in this PAD for us? Should P30 and
40 be in our computer now?

03 14 28 19 CC Apollo 8, that's negative. We had not uplinked
this PAD. We'll put this one in on the next pass.

03 14 28 26 CDR Okay. Roger.

03 14 33 28 CC Apollo 8, Houston. You have a GO for this REV.

03 14 33 34 CMP Roger, Houston.

03 14 38 29 CC Apollo 8, Houston. We have completed the tape
dump, and the recorder is yours.

03 14 38 35 CDR Thank you.

03 14 43 03 LMP Houston, how do you read? Apollo 8 on OMNI C.

03 14 43 06 CC Loud and clear.

03 14 43 10 LMP Thank you.

03 14 44 27 CC Apollo 8, Houston. We're 5 minutes to LOS;
we'll have AOS Honeysuckle at 87:38:42.

03 14 44 42 CMP Roger.

03 14 52 14 CC Apollo 8, everything looks good going over the hill.

03 14 52 21 CDR Roger, Ken. Thanks a lot. We'll see you around
the next pass. Just have our TEI update for us
when you're ready. Okay?

03 14 52 28 CC Roger.

END OF TAPE

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03 15 24 XX

BEGIN LUNAR REV 10

03 15 39 47

CDR

Houston, Apollo 8.

03 15 39 49

CC

Loud and clear, Apollo 8.

03 15 39 53

CDR

Okay. You want the computer?

03 15 40 36

CC

Apollo 8, we would like to have the high gain,
and when we get that, well, we will start a dump,
and we will start your updates.

03 15 40 44

CDR

Okay. How about reading us the PAD, and we will
try to get you the high gain.

03 15 40 57

CDR

Ken, read us off the PAD in case you can't get
the dump in; we can still do it.

03 15 41 01

CC

Roger. I have got them right here.

03 15 41 19

CC

Okay, Apollo 8. The first PAD I have is TEI 10.

03 15 41 26

CDR

Go ahead.

03 15 41 28

CC

Alright. TEI 10, SPS/G&N: 45597, minus 040,
plus 157 08919 1567, plus 35186, minus 01512,
minus 00520 180 007 000, November Alfa, plus
00186 35223 318 35018 42 0924 253; Scorpii Delta,
down 069, left 45, plus 0748, minus 16500 12994
36300 146 5005; primary star Sirius, secondary
Rigel, 129 155 010; four quads, 15 seconds, ul-
lage; horizon on 3.2-degree window line at T
minus 3; use high-speed procedure with minus
Mike Alfa. Over.

03 15 44 23

CDR

Stand by 1 second.

03 15 44 33

CDR

You got the high gain now, Ken.

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03 15 44 36 CC Roger.

03 15 44 38 CMP Houston, Apollo 8. How do you read?

03 15 44 40 CC Loud and clear.

03 15 44 44 CC Apollo 8, we would like to - -

03 15 44 45 CMP - - TEI 10.

03 15 44 50 CC Apollo 8, we would like to have you go to P00
and ACCEPT, and we would like to take the recorder
at this time; then I will copy your PAD.

03 15 45 00 CMP You have got P00 and ACCEPT, and you have the
recorder.

03 15 45 06 CC Thank you, Jim.

03 15 45 13 CMP All set for the maneuver.

03 15 45 14 CC Go ahead.

03 15 45 18 CMP TEI 10, SPS/G&N: 45597, minus 040, plus 157
08919 1567, plus 35186, minus 01512, minus 00520
180 007 000, not applicable, plus 00186 35223
318 35018 42 0924 253; Scorpii Delta, down 069,
left 45, plus 0748, minus 16500 12994 36300 146
5005; Sirius, Rigel, 129 155 010; four-quad,
ullage, 15 seconds; horizon on the 3.2-degree
mark is T minus 3; high-speed procedure minus MA.

03 15 46 46 CC That is correct, Apollo 8. Would like to confirm
the hours on GETI, 089.

03 15 46 57 CMP Roger. 089.

03 15 47 03 CC Alright, Apollo 8. I have TEI 11 PAD.

03 15 47 15 CDR We are ready; go ahead.

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03 15 47 17 CC Roger. TEI 11, SPS/G&N: 45597, 0 - correction - that's minus 040, plus 157 09118 1224, plus 36325, minus 01727, plus 01428 180 003 000, November Alfa, plus 00186 36394 323 36186 42 0995 254; Scorpii Delta, down 103, left 48, plus 0742, minus 16500 130 05 363 27 146 5144; Sirius and Rigel, 129 155 010, four quads, 15 seconds; horizon on 2.9-degree line at T minus 2; high-speed procedure with minus Mike Alfa. Over.

03 15 49 47 CMP Roger, Houston. TEI minus 11, SPS/G&N: 45597, minus 040, plus 157 09118 1224, plus 36325, minus 01727, plus 01428 180 003 000, not applicable, plus 00186 36394 323 36186 42 0995 254; Scorpii Delta, down 103, left 48, plus 0742, minus 16500 13005 36327 14651 44; Sirius, Rigel, 129 155 010; four quads, 15 seconds, 2.9-degree window mark at T minus 2; high-speed procedure minus MA.

03 15 51 15 CC That's correct, Apollo 8.

03 15 51 25 LMP Houston, could you give me the SPS helium tank temperature at about 87:20, please?

03 15 51 42 CC Okay. Stand by one.

03 15 51 47 LMP Roger.

03 15 54 10 CC Apollo 8, Houston. Our loads are in and verified; the computer is yours.

03 15 54 18 CMP Roger.

03 15 54 35 CMP Houston, Apollo 8.

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03 15 54 46 CC Apollo 8, Houston. At 87:48, we're reading 84 degrees, and at LOS we had 80. We'll take a look at the tape and see if we can find out what we had on the backside.

03 15 55 03 LMP Okay. I would kind of like to know what I might expect at ignition here at TEI.

03 15 55 11 CC Roger. We'll take that off the tape.

03 15 55 19 CMP Houston, this is 8. I take it you have loaded both state vectors; is that correct?

03 15 55 24 CC That's affirmative.

03 15 55 28 CMP Roger.

03 15 55 33 CC We loaded your CSM and LM NAV and external DELTA-V, in that order.

03 15 55 43 CMP Roger.

03 16 03 28 CC Apollo 8, Houston.

03 16 03 33 CDR Go ahead, Houston. Apollo 8.

03 16 03 36 CC Okay, Apollo 8. We've reviewed all your systems. You have a GO for TEI. One of the things we would like to do as soon as you come out on the other side is a P23. We are checking into your helium pressures now. We're going to correlate not only the last REV but the previous REV for the same location, and we will have that number for you in a little bit.

03 16 04 03 CDR Okay.

03 16 09 47 CC Apollo 8, Houston. The tape recorder is yours. I have your PTC attitude.

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03 16 09 55 CDR Roger. Go ahead.

03 16 09 58 CC Okay. PTC attitude will be pitch 10, yaw 45.
This begins at 92 hours. Over.

03 16 10 11 CDR Is that pitch 10 and yaw 45?

03 16 10 14 CC Affirmative. And looks like that will go with
the entry REFSMMAT; begins at 92 hours.

03 16 10 24 CDR Thank you.

03 16 10 31 CC Apollo 8, would you put your UP TELEMETRY to
BLOCK, please?

03 16 10 40 CMP In BLOCK.

03 16 14 49 CC Apollo 8, Houston.

03 16 14 54 CDR Go ahead.

03 16 14 56 CC Okay. On the helium tank TEMP's: that's not
recorded on low bit rate, and looking over our
tape dumps, most of this stuff we have on the
backside there is low bit rate. So we won't
be able to give you an exact number, but look-
ing at what we have every time we go out of
sight and come back over the hill, it looks
like you can expect about 82 to 84 degrees as
a nominal temperature.

03 16 15 22 CDR Thank you.

03 16 28 28 CC Apollo 8, Houston. We'd like to have the tape
recorder for about 5 minutes for one last look.

03 16 28 35 CMP Roger, Houston. You're getting it.

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03 16 28 38 CC Thank you. And I guess we still have a cryo stir
ahead of us, and we've checked your triple bias,
and there's no change.

03 16 28 52 LMP Roger. And we're stirring cryos right now.

03 16 28 56 CC Thank you.

03 16 31 20 CDR Ken, are you through with the tape recorder?

03 16 31 23 CC Stand by one.

03 16 31 28 CDR We're on a maneuver to burn attitude, and it's
going to make us lose the high gain.

03 16 31 57 CC Apollo 8, the tape recorder is yours. We have
your Double Umber update, 89:07:15.87.

03 16 32 11 CDR Roger. Copy.

03 16 32 13 CC Roger. And no change on your AOS time.

03 16 32 20 CMP Say that again, will you, Ken?

03 16 32 22 CC There's no change on your AOS time.

03 16 32 28 CDR Now what was it?

03 16 32 31 CC Okay. With TEI, 89:28:39.

03 16 32 40 CDR Thank you.

03 16 32 42 CC Roger.

03 16 47 37 CC Apollo 8, Houston. We have 3 minutes to LOS;
all systems are GO.

03 16 48 06 CC Apollo 8, Apollo 8, this is Houston. Three
minutes LOS; all systems are GO. Over.

03 16 49 16 CDR Roger. Thank you, Houston. Apollo 8.

03 16 50 55 CC All systems are GO. Apollo 8.

03 16 51 01 CDR Thank you.

END OF TAPE

APOLLO 8 AIR-TO-GROUND VOICE TRANSCRIPTION

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Tape 60

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42
26 min interval

03 17 15 XX

TEI MANEUVER

062 @ target has 105

03 17 31 12 89:31 CC

Apollo 8, Houston.

0622

03 17 31 30 CC

Apollo 8, Houston.

03 17 31 58 CC

Apollo 8, Houston.

03 17 32 50 CC

Apollo 8, Houston.

03 17 33 38 CC

Apollo 8, Houston.

03 17 34 16 CMP

Houston, Apollo 8. Over.

03 17 34 19 CC

Hello, Apollo 8. Loud and clear.

03 17 34 25 89:34 CMP

Roger. Please be informed there is a Santa Claus.

0625 ST

03 17 34 31 CC

That's affirmative. You are the best ones to know.

03 17 34 37 CMP

That burn status report: it burned on time; burn time 2 minutes 23 seconds, seven-tenths VG_X .

Attitude nominal, residuals minus five-tenths

VG_X plus four-tenths VG_X - of minus 0 VG_Z .

$DELTA-V_C$ minus 26.4.

03 17 35 14 CC

Roger.

03 17 35 19 CC

Apollo FLIGHT has -

03 17 35 23 CC

Apollo 8, reconfirm your burn time, please.

03 17 35 30 CMP

Roger. We had 2 minutes 23 seconds. Our - wait one. Change that to read 3 minutes 23 seconds.

03 17 35 43 CC

Thank you.

03 17 36 33 CDR

This gives the sensation that you are climbing, Ken.

(GOSS NET 1)

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03 17 36 35 CC Say again, Apollo 8.

03 17 36 41 CDR I say that this gives the sensation that you are climbing.

03 17 36 47 CC Roger.

03 17 36 53 CDR What's next on the docket?

03 17 36 56 CC High-gain antenna.

03 17 37 10 CC Apollo 8, at the first convenient moment, we'd like to have the high-gain antenna.

03 17 37 19 CDR You've got it; you're on the high gain.

03 17 37 25 CC Roger.

03 17 39 50 CC Apollo 8, Houston. We do not have any data on the ground yet; the voice is very good.

03 17 40 01 CDR Roger.

03 17 41 44 CC Apollo 8, Houston. We'd like to try to have you manually acquire on the high gain.

03 17 41 55 CDR Okay.

03 17 51 57 CC This will take a wide beam width.

03 17 42 01 CDR Wide beam width. Roger.

03 17 43 06 CDR Houston, Apollo 8. We've manually acquired in wide beam.

03 17 43 10 CC Roger. Reading you loud and clear. Initial tracking indicates a 4 foot per second at 8 hours will put you on target.

03 17 43 22 CDR Four foot per second at 8 hours.

03 17 43 25 CC Correction, that's 15 hours.

03 17 43 27 CDR Roger. Roger.

(GOSS NET 1)

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03 17 43 43 CC Apollo 8, we have data; we'd like to have the
tape recorder.

03 17 43 50 CDR You can have it.

03 17 43 52 CC Thank you.

03 17 45 11 CDR Houston, Apollo 8.

03 17 45 12 CC Go ahead, Apollo 8.

03 17 45 17 CMP Roger. Do you wish me to reinitialize the W-matrix
at this time?

03 17 45 26 CC Affirmative, Apollo 8.

03 17 45 31 CDR Roger. And that - -

03 17 45 43 LMP Houston, Apollo 8. Which battery do you want us
to start charging?

03 17 45 52 CC Okay. We'd like to start on battery Alfa.

03 17 45 57 LMP Battery Alfa. Okay.

03 17 46 08 CC Apollo 8, would you go to NARROW BEAM on the
high gain?

03 17 46 17 CDR Just a minute.

03 17 46 27 CDR We're on NARROW BEAM.

03 17 46 29 CC Roger. Sounds real good now.

03 17 51 33 CC Apollo 8, Houston.

03 17 51 38 LMP Go ahead, Houston. Apollo 8.

03 17 51 40 CC Okay. If you'll go to POO and ACCEPT, we'll
update the REFSMMAT, and I have some backup GDC
angles for the new entry REFSMMAT.

03 17 51 51 LMP Roger. Understand; POO and ACCEPT, and you'll
give us the new REFSMMAT.